UCRL-JC-124190 Abs

Abstract Submitted
for the DPP96 Meeting of
The American Physical Society

Sorting Category: 5.5 (theoretical)

Calculation of the Radiative Cooling Coefficient for Molybdenum in a Low Density Plasma K.B. FOURNIER, W.H. GOLDSTEIN, A.L. OSTERHELD, Lawrence Livermore National Laboratory, M.J. MAY, S.P. REGAN, M. FINKENTHAL, H.W. MOOS, The Johns Hopkins University, J.L. TERRY, J.A. GOETZ, MIT Plasma Fusion Center, D. PACELLA, ENEA - Frascati Tokamak Upgrade — Collisional radiative models for the molybdenum ions Mo^{6+} to Mo^{39+} have been generated with *ab initio*, relativistic atomic structure data. The collisional radiative emissivity of each ion, and a coronal ionization state abundance calculation have been used to calculate the radiative cooling coefficient for molybdenum (Z=42) in a low density plasma. The present paper offers a critical evaluation of the ionization and recombination rate coefficients used to predict the abundance of each molybdenum charge state. The contributions to the total radiative line power from different molybdenum ions (N-, M- and L-shell ions) and from different classes of transitions (Δn=0 and Δn=1) is assessed. The contributions to the total power radiated by molybdenum ions from collisional radiative line emission, dielectronic and radiative recombination are assessed. A comparison is made between the present, detailed calculation and an average ion model. Spatial profiles of the bolometric power losses from the Alcator C-Mod and the Frascati Tokamak Plasma are compared to predictions made with the current radiative cooling coefficient for molybdenum. Work supported in part by U.S. DoE contract W-7405-ENG-48.

Kevin Fournier
fournier2@llnl.gov
Lawrence Livermore National Laboratory

☐ Prefer Oral Session
☒ Prefer Poster Session

Date submitted: June 17, 1996

Electronic form version 1.1